WHAT IS CLAIMED IS:

1. A method for manufacturing an optical fiber coupler by heating and fusing at least a part of a contacting part of plural optical fibers, the method including the steps of:

inputting lights of different wavelengths into a first end of any one of the plural optical fibers and reading the lights output from second ends opposite to the first end of the plural optical fibers during the fusing process; and

stopping the fusing process when a value of a branching ratio difference between the lights of respective wavelengths output from the plural optical fibers becomes substantially equal to a value of a branching ratio difference that is found in accordance with a relational expression representing a relationship in a previously manufactured optical fiber coupler between an branching ratio of the light of either one of the wavelengths and a branching ratio difference from the light of the other wavelength.

2. The method according to claim 1, wherein the relational expression is an approximate function representing the value of the branching ratio difference of the lights output from the second ends of the plural optical fibers when the fusing process of an optical fiber coupler is stopped, with which branching ratios of lights of different wavelengths become substantially equal in final form.

3. The method according to claim 1, wherein the relational expression is an approximate function representing the value of the branching ratio difference of the lights output from the second ends of the plural optical fibers when the fusing process of an optical fiber coupler is stopped, with which branching ratio of a light of either one wavelength becomes equal to a predetermined value in final form.

4. The method according to claim 2, wherein the relational expression is linear functions that are different from each other and respectively given for predetermine ranges of branching ratio.

5. The method according to claim 2, wherein the relational expression is an approximate curve based on linear functions that are different from each other and respectively given for predetermined ranges of branching ratio.

6. The method according to claim 2, wherein the relational expression is a cubic

function.

7. The method according to claim 6,

wherein the relational expression represents a condition for manufacturing the optical fiber coupler that branches the input lights of different wavelengths at a substantially same ratio and expressed as $-0.00001x^3 + 0.001557x^2 + 0.08135x$, and

wherein a value of branching ratio difference for stopping the fusing process is computed by assigning a value of branching ratio of the light of the wavelength read during the fusing process as "x".

8. The method according to claim 6,

wherein the relational expression represents a condition for manufacturing the optical fiber coupler that branches an input light of at least one wavelength at a predetermined branching ratio and appropriately branches the other wavelength, the relational expression being expressed as $-0.000025x^3 + 0.0025x^2 + 0.16x$, and

wherein a value of branching ratio difference for stopping the fusing process is computed by assigning the value of branching ratio of the light of wavelength read during the fusing process as "x".

9. An optical fiber coupler manufacturing apparatus comprising:

a holding section for aligning and holding plural optical fibers substantially in parallel;

a heater for heating at least a part of the plural optical fibers held by the holding section;

a drawing section for drawing the optical fibers heated by the heater; and

a controller for controlling the heater and the drawing section,

wherein the controller includes: a light inputting section for inputting lights of different wavelengths into a first end of at least any one of the optical fibers; a sensor for detecting lights output from second ends opposite to the first end of the plural optical fibers; a storage for storing information regarding a relational expression representing a relationship in a previously manufactured optical fiber coupler between an branching ratio of either one of the wavelengths and a branching ratio difference from the different

wavelength; a computing section for computing a branching ratio difference of the lights detected by the sensor and outputting a predetermined control signal when recognizing that a value of the computed branching ratio difference becomes substantially equal to a value of branching ratio difference which is found based on the relational expression stored in the storage; and an operation controller for stopping the heating by the heater and the drawing by the drawing section.

10. An optical fiber coupler manufacturing apparatus that implements a method for manufacturing an optical fiber coupler by heating and fusing at least a part of a contacting part of plural optical fibers, the method including the steps of:

inputting lights of different wavelengths into a first end of any one of the plural optical fibers and reading the lights output from second ends opposite to the first end of the plural optical fibers during the fusing process; and

stopping the fusing process when a value of a branching ratio difference between the lights of respective wavelengths output from the plural optical fibers becomes substantially equal to a value of a branching ratio difference that is found in accordance with a relational expression representing a relationship in a previously manufactured optical fiber coupler between an branching ratio of the light of either one of the wavelengths and a branching ratio difference from the light of the other wavelength.

11. An optical fiber coupler that is manufactured by implementing a method for manufacturing an optical fiber coupler by heating and fusing at least a part of a contacting part of plural optical fibers, the method including the steps of:

inputting lights of different wavelengths into a first end of any one of the plural optical fibers and reading the lights output from second ends opposite to the first end of the plural optical fibers during the fusing process; and

stopping the fusing process when a value of a branching ratio difference between the lights of respective wavelengths output from the plural optical fibers becomes substantially equal to a value of a branching ratio difference that is found in accordance with a relational expression representing a relationship in a previously manufactured optical fiber coupler between an branching ratio of the light of either one of the

wavelengths and a branching ratio difference from the light of the other wavelength.